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ABSTRACT

The principal problem of this work is to discover, perhaps construct, a pedagogical process for thinking about the future that makes use of the methods of forecasting, but makes use of them to create new attitudes and understandings on the part of institutional planners. The underlying concern is to develop a way for planners to address the future without forgetting the future of individuals. It is an attempt to set out a role for the citizen in future planning, and to develop an argument for the use of sustained divergence of opinion in planning, rather than the pursuit of consensus. Further, the work supplies the first pedagogy for the use of futures terms now generally used with no fixed meaning and details the rationale for a comprehensive training program for planners in moral understanding of the concerns they must address in planning the future environment for all men. Chapters include: 1) Delphi: A Tool to Develop Future Environments; 2) Expository Methods (Future Histories and Scenarios); 3) Value Shift Assessment: A Tool to Examine Goal Impact; 4) Future History Analysis and Review: A Tool to Examine Strategies; 5) Cross-impact Matrix and Cross-purpose Matrix: Tools for Planning; and, 6) The Study of the Sufficient Future: The Logic of Suspended Disbelief. (Author/JLB)

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THE PEDAGOGICAL STRUCTURE OF METHODS FOR THINKING ABOUT THE FUTURE: THE CITIZEN'S FUNCTION IN PLANNING

by

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The Pedagogical Structure of Methods for Thinking About the Future: An Instructional System for Planners

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RATIONALE

The complexity of today's long-range goals are so far reaching, so expensive and include so many vested interests hidden under the rubric of a catchy goal statement that the strategies to the goal's attainment and the groups of society they affect are seldom explicated to the public and their complaints (those of the affected publics) are seldom if ever addressed or examined.

The citizen rallies around a goal for some distant moment in time without a sense of the impact of the intervening events on his life or a feeling of control. This work will hopefully spell out for the reader the trust he can place in his own judgment and the significant questions he can address to planners to determine the inputs they examined when setting their goal. It should supply a set of questions that demand address by planners and can be seen as weapons in the hands of the citizen.

It should arm the citizen with direct, reasonable questions, attention to which would clarify the reason for belief in the worthiness of the goal in human terms.

It further supplies the first pedagogy for the use of futures terms now generally used with no fixed meaning and details the rationale for a comprehensive training program for planners not in technique but

in moral understanding of the array of concerns they must address in planning the future environment for all men.

Categorically, it faults expertise about the future; outlines, challenges, redefines several methods used in planning; defines words; and sets a framework for thinking about the future.

PREFACE

This work consists of an exploration of methods currently in use for the study of the future. But it is not an exercise in forecasting, nor is it an exploration of forecasting methods for the purpose of forecasting alone. Presumably, the reasons that men want to engage in forecasting go far beyond the mere formulation of forecasts themselves. We are usually interested in forecasting as an aid in planning.

This work has to do with the employment of methods of forecasting as instruments of planning. How can those methods be used to influence the planning process? In short, how can they be employed by men as a kind of pedagogical system that will affect the ways in which planners think about the future? How can the future-perspective affect the planning process? These are the problems at the heart of this inquiry into the logic of non-data based methods of thinking.

Furthermore, it needs to be kept clearly in mind that the inquiry undertaken in this work deals with more than mere planning: It deals more specifically with institutional planning. The principal problem of this work is to discover, or perhaps to construct, a pedagogical process that makes use of the methods of fore-

casting, but makes use of those methods not merely to generate forecasts but to create new attitudes and new understandings on the part of institutional planners. In short, the effort is then to see whether there is a structure to methods of forecasting that can be converted into methods of planning. Thus, the adoption of those methods is studied here not in order to know the future, but to participate more effectively in its development.

While this work details several methods and sets out their application in a simulated environment, it does not describe a simulation. The position taken is that while simulations usually have individuals play roles of others, in the environment described here the individual participants play the role of themselves at various discrete moments in time. Secondly, while simulations usually pit the player either against an environment or other players in a win-lose setting to see how the environment behaves under manipulation, here the purpose is to help the individual examine how he will behave if certain environments come to be.

The literature dealing with simulation and gaming typically concentrates in one of two areas: its value either for education or for predicting and forecasting. The work of Theodore Gordon and Olaf Helmer at RAND Corporation and more recently at the Institute for the Future, and the efforts of Herman Kahn of the Hudson Institute,

are on the forefront of efforts to use simulations for prediction and forecasting alternative social futures.

As early as 1959, Olaf Helmer and Nicholas Rescher wrote "On the Epistemology of the Inexact Sciences" (Management Science, 1959), and dealt in part with simulation modeling as "a useful prediction device when experimental procedures would be impractical, immoral or costly" (p. 48). Helmer, in his book Social Technology (April 1966) again addressed the utility of simulation modeling in predicting and forecasting (p. 7); however, in both cases the simulations specifically selected elements to be manipulated and held constant as in classic experimental studies to see how the environment behaved. In September of 1966, while at RAND, Helmer developed a simulation for the study of future values. In a report of that simulation, A Use of Simulation for the Study of Future Values, he spoke of "looking at the method of simulating the process of social planning as a means of arriving at a moral evaluation of alternative futures" (p. 3). The invited participants were addressed as "experts."

In September of 1969, Enzer, et. al., at the Institute for the Future, ran a simulation exercise whose inputs were drawn from three earlier commissioned studies. They reported the exercise in a research report (R-9) entitled A Simulation Game for the Study of State Policies. In this simulation they sought out "valuable in-

sights into rational planning behavior patterns that could be used to develop mathematical analogs for use in later computer analysis and synthesis of many possible futures" (p. 2). Their concern in modeling systems amenable to experimental analysis persisted and they saw role play of complex subgroups of society by "experts" as an acceptable reflector of ". . . rational planning behavior . . ."

Likewise Herman Kahn, while at RAND, in an early work, War Gaming, details many of the problems with gaming but considered "simulation and gaming efforts excellent modes to test hypotheses in action" (June 1957, p. 13). However he noted that it is ". . . unlikely that win-lose games can afford a useful ground to test strategies in that the enemy is always weaker in play than in reality" (p. 13). Later, in 1966, Kahn, by this time at the Hudson Institute, wrote On Alternative World Futures: Issues and Themes. In it he discusses the array of methodologies useful for long-range examination. He points to the examination of conflict and the examination of internal affairs as future concerns amenable to simulation (p. 23).

Edward Holland and Robert Gillespie, while at M.I.T., wrote Experiments on a Simulated Underdeveloped Economy (1963). They had developed complex computer simulations of discrete pieces of developing economies for the specific purpose of predicting and forecasting. Their efforts are unique in their attention to and acknow-

ledgement of the limited quality of "data" in planning and policy analysis (Chapter 9).

The value of simulation for education has been most clearly set out by Saran S. Boocock and E. O. Schild in their book, Simulation Games in Learning (1968). They cite values for simulation in education that include "sufficient abstraction for system examination" (p. 9); "social roles they impose" (p. 10); "its power for attitude change" (p. 16); "increased efficacy through role play" (p. 105); and "the learning of strategies" (p. 144). They point out that "simulation is a technology which works, but we do not really know why" (p. 22).

Jose Villegas, et. al., at Cornell University, have developed an array of educational simulations to help groups develop an efficacy and understanding about minority group concerns. Although mostly unpublished works, several are available in mimeographed form. Some of the earliest of these are A Squatter Settlement in the Year 2000 (Spring 1968), School Desegregation (Fall 1969), and A University Game: Cornell Edition (Fall 1969). Although Villegas' work begins to involve certain players in the construction of the simulation and utilizes as format certain aspects of several futures methodologies in the game plans, they still treat participants as role players of specialized others. In all the cases mentioned above,

the simulation rules are imposed on the participant players and the role exercised by each player is not that of himself.

Unlike those interests and approaches, the following study approaches simulation rather as an environment about the future constructed by participating individuals, the parameters of which constitute rules for play. Secondly, the simulation environment described here has as its purpose the testing of alternative plans for the future.

The future is a concept dealt with in the literature of most if not all disciplines or areas of inquiry. The several aspects of the pedagogy developed here evolved from the work of many men in diverse fields, ranging from Operations Research to Philosophy.

For example, a basic problem to be addressed in this work is the nature of information applicable to future planning efforts. Edward Holland and Robert Gillespie, mentioned earlier, have developed a useful set of arguments about the nature and utility of data. They view extrapolations and manipulations of data as useful exercises for predicting and forecasting. Useful though they are, such extrapolations and manipulations of data do not of themselves yield decisions in the process of planning. That is, they are not sufficient, nor directly useful to the extent that policy

and planning imply a concern with goals that is typically omitted from such manipulations of data (Holland and Gillespie, Chapter 9).

Goals are a component of a future perspective. Goal statements are reflectors of beliefs. Belief claims are the concern of philosophers. Thomas F. Green, in his excellent work The Activities of Teaching (McGraw-Hill, 1970--in press), presents an analysis of the relation between the concepts of knowledge, truth, and false belief. He argues that it is possible to believe what is false but not possible to know what is false (Chapter 5, p. 13). Although belief is a part of any knowledge claim, knowledge is not necessarily a part of belief claims. Green concludes in part that "there are vast areas of human concern which are commonly understood not to deal with knowledge at all but with insight, wisdom or simply conviction" (p. 19). And further, "Beliefs, after all, cannot be assessed in ignorance. They cannot be assessed until it is understood how it is that men who have held them have found them reasonable to believe" (p. 22).

On the one hand, we are faced with a lack of data to which we can attach truth or knowledge claims when making policy or planning goals, and on the other hand, we are faced with goals that are themselves reflectors of beliefs--beliefs that need not necessarily carry with them a condition of truth.

A semantic logician, Nuel Belnap, with System Development Corporation, wrote a comprehensive document, An Analysis of Questions (1963), in which he detailed a type of question to which the answer cannot be known to be true at the moment of utterance. According to Belnap this type of exchange is a kind of reply that does not fulfill the criteria for an answer because it does not satisfy the truth condition imposed on answers. I have called this type of reply 'responses' in this pedagogy, arguing that a response is an acceptable reply with a logical and believable connection to the question but with no necessity of proving its truth. This distinction has the pedagogical value of freeing the individual to trust his response almost as a belief without having to contend that it is true.

V. I. Pudovkin, in his work Film Technique and Film Acting (1960), develops the concept of suspended disbelief for participating audiences of film. This idea adds another link in the developed pedagogy. It offers a rationale to allow men to consciously deal with conjecture and tentative truths while examining periods of future time not amenable to direct examination in reality. This concept underlies the developing notion of future histories detailed in the text.

Helmer and Gordon at RAND and later at IFF, as well as Pardee and Dalkey at RAND have developed and refined specific methods

for forecasting and predicting. In Social Technology Helmer and Gordon detail an early Delphi study administered in 1963 while Helmer was still at RAND (1966, pp. 44-97). This technique (Delphi) has been refined, modified and revised countless times, with state of the art reports and evaluations being published periodically by Helmer (December 1966; September 1969), Dalkey (October 1967; June 1969), and Gordon (September 1969). In all cases the concern has been with the manipulation of "data" and "expert" consensus. While extremely useful for forecasting and predicting technological events, efforts to date in using Delphi for examining societal consequences or for the assessment of outcomes for planning have been of little value.

Out of the concern to develop a method to examine the interactions of the events drawn from a Delphi, Gordon, in 1968, developed the Cross-Impact Matrix, experimented with it, and reported his work in an article entitled "Initial Experiments with the Cross-Impact Method of Forecasting" (Futures, December 1968).

F. S. Pardee had noted the vexing problem of dealing with the cross impact of events as early as 1967 in a RAND Research Corporation Report (Technological Projections and Advanced Product Planning). But there has been to date no published attempt to integrate these methods in a planning process. What attempts there are to contribute to the planning process are severely faulted. This point is elaborated in Chapter II below.

Up to this moment the pedagogy developing for the study of the future has been sporadic and isolated in discrete areas of the literature with no attempt made to cover in adequate detail the array of concerns addressed by planners.

The existing constructs and terminology in use for discussing the future have been primarily the developing language of a small but powerful group of men. These men are commonly referred to as the futurists, or future experts. A concern of this document is with the nature of expertise about the future. Does it exist? And if so, who has it?

The futures expert is discussed in detail in a paper by Robert Wolfson and Manfred Stanley, Beyond the Invisible Hand: Policy Advisors and Their Clients (1969). They argue that the citizenship role is disappearing in complex societies and that a stance of value neutrality by futures experts is in fact an advocacy position for whatever groups their clients represent. I have drawn heavily from this document in developing my arguments for a more comprehensive role for the citizen in planning, and to discount the oft-touted position of value neutrality expressed by the various future-oriented centers.

Kurt Baier and Nicholas Rescher's work Values and the Future (1969) attempts to form a conceptual framework for discussing values. From their work, I have drawn a discrete set of questions

that can be asked of goals, grouping them under the heading "Value Shift Assessment," as one more tool for planning.

As early as 1957, Herman Kahn coined useful terms such as "Scenario" and "Future History" and used them interchangeably in his early work, On Alternative World Futures, and more recently in The Year 2000 co-authored by Anthony Wiener (1967). But there is no consensus about how these terms are used or might be integrated in a comprehensive schema for planning.

On the whole, within this body of literature there is no attempt to develop a pedagogical system that is either as comprehensive as this effort in its utilization of various forecasting methods, nor as systematic in how it strings the various techniques of thinking about the future into some coherent process of learning for planning purposes.

A final note is needed in this Preface on the somewhat special sense in which the term "data" is being used. Data here is used to mean quantitative information that can be manipulated as knowns to arrive at predictions or forecasts. Data is treated as information that satisfies the condition of truth. "Non-data" is used here to refer to information that is conjectural in nature, i.e., based on belief. Further, it refers to the responses of individuals who are addressing questions about the future for which

data do not exist. It is a term coined to separate testable knowledge from untestable belief.

A further purpose of this document was to strip out of those methods and titled ideas men use to think about the unknown future the questions they ask themselves and the nature and uses of their responses in planning.

The underlying concern of this work is to develop a way for planners to address the future without forgetting that the future is the future of individuals--people. It is an attempt to set out a role for the citizen in future planning, and to develop an argument for the use of sustained divergence of opinion in planning, rather than the pursuit of consensus as the sought outcome of the process.

The development of this work has been a process of discovery. It is written also as a process of discovery. The argument unfolds. It should therefore be read as a discovery process. Always in such efforts, the beginning is never apparent until the end. The reader will need to "suspend his disbelief" and exercise his patience in confronting the development of the text.

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CHAPTER I

INTRODUCTION

Man is a creature who is conscious of his future. While the amount of time available to him to weigh his decisions (decisions that will affect both his future and the future of his fellows is continually decreasing, the number of decisions he must make is increasing. Pressed by time, the future is crowding man's ability to operate rationally and effectively in his own best interest. Under this pressure men now concern themselves with moments further into the future than ever before.

While the short-term future is closer and more apparent, the long-term future is distant and less apparent. The farther into future time we extend our concern and attention, the more unknowns must be dealt with in conjectures about the several futures which demand examination. Unlike the short-term future, the long-term future cannot be perceived as a continuous extrapolation of the past in some quantifiably larger or smaller fashion, rather it must be perceived as an array of possible futures.

The parameters of the short-term future can be fairly accurately forecast by an examination of the decisions made in any moment in time. Within certain known boundaries man can count on his future. However, technological innovations not yet conceived will explode these boundaries, beginning new alternative futures outside the old parameters that planners carefully kept within during planning. It is these new unknowns that have provoked the

pursuit of surprise-free future projections and the casting of alternative future conjectures--conjectures that are only limited by man's perception of "what could be."

Men try to delimit a plausible future when they pursue goals. Different men plan for different goals. Goals have several common characteristics. All goals are not yet occurring states of affairs that are sought after by someone or some group. These goals and their proponents may be at odds with each other. A second common quality of goals is that to be attained, one or another strategy must be implemented or allowed to exist. The choice of strategies in the pursuit of goals needs as complete an analysis as the goals themselves. Strategies for the attainment of goals for the 'long-term future' must be carefully assessed. The purpose of strategy assessment is to delimit that strategy which leaves the most options open to the emerging generations.

The problems that long-term planners may experience when choosing strategies that will impact on society for decades to come may be reduced or eradicated by an understanding of the processes available to them for examining the long-term future. The effectiveness of their decision-making may be directly related to their feelings of competence while handling the unknown future.

Men conceive of the passing of time, both the past and the future, as aggregate concepts. Though the past is a series of occurred 'present moments,' the future is a series of 'not yet occurred' present moments--moments that can be disaggregated and examined in some detail.

The past and future are generally disaggregated into short-term and long-term periods. The short-term past--or more recent past--is examined with the set of techniques appropriate to it. Events are restructured and taken apart through the best information available--usually by direct examination of the hard evidence that remains of the event, from the several individuals that experienced the event or were involved with its occurrence.

The long-term past or more distant pasts are examined with techniques appropriate to them. Events are thought of as past experience. Evolving attitudes are examined by historians. Through their searches of the recorded memories of individuals who noted their observations at the time, the historians piece together their descriptions of that past occurred moment in time. The subjectivity of the historian is imposed on whatever accounts he will choose to believe.

Similarly, the methods for examining the short-term and long-term futures differ. The short-term future can be rather

clearly specified and the parameters detailed by the extrapolation of the hard data (trends, etc.) available to the short-term planners. Through the experts who interpret that data, competent synthesis can delimit the options for change and growth open to man for the near or short-term future. These 'data based methods' for examining the short-term future have as exemplars the rigorous techniques of PERT, PPBS, and the economic and demographic data that statisticians have collected over the past several hundred years. In addition, men on the forefront of their respective fields can be interviewed.

Like the long-term past, an examination of the long-term future has methods appropriate to it. For these, there are no hard data, and expertise and objectivity are difficult to recognize. New discoveries and technological innovations (and applications of those discoveries and innovations) often occur outside the mainstream of research and development. The Polaroid camera is an example. <u>The further into the future men project their concern the greater the number of impacts their actions appear to have</u>. The unthinkable events that he cannot conceive <u>through</u> extrapolation of the present become visible and plausible when conjectured into the long-term future. Processes for systematically examining these several alternative long-term futures are extant and might be referred to as 'non-data based methods.' These methods, like those unique to the long-term past, are subjective and based on

man's ability to synthesize an array of assumptions made from the best available information--more specifically, those pieces of information to which he chooses to attend.

Although the information base for the long-term is less stable than that available for short-term examinations, it is no less valuable or legitimate. As with the past, the future has many interpretations and each may be as true as the next. Their value is to help the several societies of the world examine alternative views of the evolving continuum of what-has-been to what-can-be.

This study is concerned with the non-data based methods for examining the future. This attention to the non-data based methods is concerned less with what men can know about a future and more with what men can do about the future.

Methods for examining the long-term future have been developed over the last ten years and formalized into specific units of inquiry. They each have a specific type of input, a specific procedural sequence of tasks that must be met, and a visible output display that is generally accepted as information.

When several of these methods are examined in a unique order (an order roughly paralleling that of their development) they appear to have an inherent logic that spans the array of questions

men might reasonably ask of themselves about the long-term future when setting goals and planning strategy. When examined in isolation, the output of any method may deny or exclude the use of the next; but when examined within a unique order they appear to take on a new synergistic dimension, and act not to generate information, but to focus man's attention in an orderly way on the array of questions that underlies each of the methods.

That is, the methods under consideration seem to be an array of specific questions that long-term planners confront in their attempts to examine the unknown long-term future. When examined as an array of specific questions, they have a natural logic about them. They seem to focus the long-term planner's attention towards an ever-expanding perception of alternative moments in time.

When men conjecture about the nature of the long-term past or the long-term future, they generate an array of responses. Unlike either the short-term past or the short-term future, where relatively clear answers can be given to questions by drawing on data, the longer term periods provoke responses or replies that are less certain but equally as useful.

Responses to questions about the long-term future--like those of the long-term past--are more subjective than those for

the short-term. This subjectivity reflects personal perceptions, beliefs and values. Men may attempt to be completely objective, but their objectivity is completely subsumed under their subjective decisions about what they will try to be objective about.

Organizations like the Institute for the Future and the Hudson Institute which consider the future their area of expertise often represent themselves as value-neutral advisors about alternative futures. That is, there is a conscious attempt to not take an advocacy position. This value-neutral status appears to have one major fallacy--the input that is solicited from the policy planning groups is subjective and reflects the perceptions, beliefs, and values of the policy groups requesting expert service. The value-neutral stance does not supply value-neutral output; rather it legitimizes one subjective viewpoint or array of views (Wolfson and Stanley 1969, p. 6).

The responses long-term planners generate to the several questions they ask of the long-term future are value-laden and reflect their specific views. The claim that the future centers take a value-neutral stance, <u>if it is true, can only be true in reference to the questions they direct the policy planners to attend to</u>.

Planners responsible for short-term goals are concerned with problems occurring <u>now</u>. An example of a short-term goal might be the housing of a displaced individual in urban renewal efforts.

Their attention is directed toward creating a better, cleaner, or safer now. The goals they pursue tend to be stated in "IF-ONLY" terms (for example, if-only the war were over, I wouldn't mind being drafted now). The statement of an if-only proposition is a statement of a wish for a different or better now. The problem with if-only goals is that if they obtain, they do so in some future present moment. The moment of the goal's attainment is a different present moment than that experienced when the goal and its operational strategy are specified.

The moment when the problem is specified, the goal stated, and the strategy chosen, is a now moment. The moment that should command equal, if not greater attention, is the moment of goal attainment; that future present moment when the if-only goals will have been reached.

Short-term goals can have their attainment moment assessed rather accurately by planners. Planners can ask certain basic questions. Many of these questions can be answered from existing trend data and survey information about the effects at some moment in the short-term future of the attainment of the goal. When the results are attended to, this type of examination may lead to a choice among alternative strategies.

Short-term planners are less concerned about developing technology and extrinsic news events in the pursuit of their goals. Their chosen strategy, once approved and funded (if adequate to

accomplish the task), enters an operational phase that rarely is affected by events or developments outside the parameters of the specific goal. Operational strategies represent large enough investments of time and energy and display visible results-in-progress such that little can impact on the chosen strategy or the goal's attainment.

Long-term planning is concerned with <u>developing</u> problems--problems that will not exist for years to come, if at all. These long-term conjectures are not stated in terms of if-only goals and are not wishes for a better now. However, they often reflect aspects of <u>now</u> continued into the future unchanged, as if the long-term planner ignored the intervening years and the presently existing forces which are basic change agents in human behavior, desires, values, and beliefs.

This incomplete painting of a long-term future may be the result of:

- an incomplete examination of the probable intervening events
- an attempt to develop only a piece of the future in isolation
- an inability to examine the moment of the long-term goal's attainment from an appro-

priate role; a role in that future present moment and the several intervening moments that will exist in the interim

- a lack of knowledge, or memories, of the future to draw on in the analysis and synthesis of those futures.

This study will examine six methods now extant to help long-term planners assess their strategies and goals for the long-term future. The six methods are: Delphi, Future Histories, Scenarios, Value Shift Analysis, Future History Analysis, and Cross-Purpose/Cross-Impact Matrices. The synergistic use of these non-data based methods (which serve to focus individuals' attention on an array of questions), presented in a logical order, may serve to limit the effect of the results of these faults.

Before an examination of future events can begin, those events must be conjectured, collected, organized, and assessed. Men must judge the events for plausibility, probability, and desirability, and delimit the probable time parameters for the events' occurrence. The process of systematically collecting and assessing conjectures about alternative future events is carried on by long-term planners who ask themselves a series of questions about the future. One method that exists for this purpose is the

DELPHI. Its primary purpose is the systematic collection and assessment of future conjectures. The responses of the several individuals about the events can be displayed on a time line, creating, in effect, an environmental learning space from which can be constructed several internally plausible and probable consistent future environments. When the events drawn from the Delphi are arrayed on a continuum over future time, they can be thought of as an intellectual playground created by the long-term planners involved and representing one set of knowns that will limit their actions and concerns while they examine their goals.

This environmental learning space, created by long-term planners engaged in long-term planning activities may serve a useful purpose by giving the planners temporary--but firm--limits within which they can examine their several goals for an unknown future. The future environment exists only through the consent of this group concerned with long-range planning. Further, these several individuals are responsible for or concerned with the pursuit of different goals. Each goal involves the choice of a specific strategy. These may occasionally be interrelated and mutually beneficial or they may be mutually exclusive and diametrically opposed. The pursuit of each goal's attainment will demand the allocation of resources that may be limited and in demand by other goal advocates. When the examination of long-term strategies and the goals they pursue are assessed in a

future environment against several others--that may or may not be competing for limited resources and may or may not be at odds with each other--the individuals have an opportunity to assess their goals for a tomorrow.

The environmental learning space, or future environment, appears to serve several purposes: First, in a future environment the assessment of goals is not done in isolation, but against the pressing reality of competing perceptions of what that tomorrow should be. Secondly, when several individuals examine their perceptions against those of others within a commonly agreed environment, the strategies and goals they advocate will display their weaknesses and strengths to the mutual benefit of all involved.

Within this future environment the several other non-data based futures methodologies might be examined and learned. The questions pursued by the several methods appear to weave a path through the future and back to the present directing attention first toward one set of questions and then another, criss-crossing the time examined. The non-data based methods--and a logical order for their application in a future environment--examined here, will be detailed in the body of this work and comprise what appears to be a useful way for long-term planners to systematically address their concerns about the unknown. The

Delphi method is one useful set of questions to help individuals construct a plausible future environment in which to examine their several goals (See Chapter II).

Within this environmental learning space the individuals might write FUTURE HISTORIES from a future present moment back to the present (See Chapter IIIA). From these several future histories, SCENARIOS of select moments in time are constructed--moments when planned goals will obtain (See Chapter IIIB). These several goal attainment moments can be assessed in terms of the INDICATORS that would exist if the goals obtain and also the VALUE SHIFTS that may occur over time (See Chapter IV).

From these several assessments a FUTURES HISTORY ANALYSIS can be constructed for each of the several goals to delimit a strategy towards their attainment that leaves the greatest number of options for change open to developing generations (See Chapter V). The goals and their several strategies can then be arrayed in a CRO$S-PURPOSE MATRIX to allow the several goal advocates to contrast their pursuits and perceptions against each others (See Chapter VI).

The examination in a future environment of individuals' goals for the future against the several methods mentioned here might be compared with a simulation. However, there are several distinctions which make it inappropriate to subsume future environ-

ments under the general canopy of simulation. First, in simulations the role the individual plays is seldom himself. He is asked to identify with the complex role of another, and demonstrate those behaviors he perceives to be appropriate reflectors of that role. The future environment exercise demands that the individual play at being himself in several future present moments.

The second distinction is of equal importance. One of the stated values of simulations is that they compress time to facilitate the examination of the environment being simulated to see how it behaves. The future environment concept is not concerned with how the (future) environment will behave but how the several individuals will behave in that (future) environment.

Individuals concerned with examining alternative long-term futures do so in role--a role they are experiencing at that present moment. That role is defined rather precisely by their age, authority, needs, desires, values, beliefs, and perceptions. In short, it might be said they play at being themselves based on their perceptions of themselves and the milieu they are a part of. Their individual perceptions of themselves at any moment in time impacts on their actions. I will not belabor the arguments about self, and perceptions of self, as they impact on individuals' actions. Rather I accept the importance of self perceptions and self interest in decision-making.

When historians report the past, they not only attempt to locate occurrences in a continuum of events, they also try to examine the beliefs and values of the individuals living in those moments to demonstrate how an occurrence came to be, could exist, and was understood. A good historian tries to understand what people were like. To do this he simulates the thought processes he believes they would have followed in a past present moment. He attempts to draw only on that information about the past that might be legitimate for the time frame under examination, not on information that is unique to his own generation. He tries to experience a role moment other than the present to better understand the moment under examination. The necessity of knowing and operating with an appropriate role moment when examining other moments in time is crucial to the individual concerned with the long-term--either past or future.

Short-term planners need not be as concerned about role moments in their strategy assessments. Short-term goals for a different future moment probably will not reflect major value shifts in the individual or his immediate generation. Long-term planners, however, must attend to an appropriate role moment. Certain characteristics of any role moment can be rather easily perceived; for example, age, probable job status, family relationships, property and goals. This information serves as a base from

which individuals may pursue an examination of a future. The questions they ask of themselves help clarify and fill out their role. An example may be useful here: When a goal has an attainment moment 20 years into the future, the environment will be different at the moment of attainment than at the moment of its specification. The individual and his significant others will also be modified by those twenty intervening years. If the planner were 40 years old at the moment of goal specification he would be 60 at the moment of goal attainment. If he bore a son at the moment of goal specification, that child would be 20 at the moment of goal attainment. The planner would be retiring, his son cutting his intellectual teeth and trying to understand the actions of his father as they impact on his 20 year old life. This rather obvious state of affairs can have great importance, if not great value, for the individual in his assessment of his strategies.

The pursuit of goals for the future must be examined from a perceptual base of the individual as himself at the moment of the goal's attainment to determine who will benefit or how the attainment of the goal will impact on his life at the moment of attainment. An understanding of role moment assessment precedes any participation in a future environment and serves to further limit the ambiguity of the unknown.

The assessment of a role moment located in some future present moment cannot be complete. However, that assessment is no less valuable or important than similar examinations of past present moments. When men ask questions of their past they step into a role moment in the past and pick and choose out of their memories those images they believe to be accurate reflectors of their past--they edit their memories in an attempt to recall their past. Those edited memories based on their perceptions of the moment are legitimized by our judicial system through the use of witnesses and experts.

Similarly, when long-term planners' concerns are with moments in the long-term future their role moment assessments and goals, arrayed in a future environment, supply them with edited memories of the future. These future memories are legitimized in an intellectual playground--a period of time within which they have all agreed to suspend their disbelief. It is on the basis of their willingness to suspend their disbelief that they can deal with the ambiguity of the unknown future.

The several non-data based methods, when examined in a future environment constructed by participating individuals who adhere to the preceding conditions, may reduce the ambiguity of the unknown to manageable but realistic proportions and facilitate a comprehensive examination by individuals of the impact of their

projected actions on the lives of men. Society in general does not plan, think, act, and feel. Rather specific individuals in specific circumstances do. It is their experiences that provide the data for their conjectures. Long-term planners must understand the nature of the tools appropriate to their concern.

This study will examine each non-data based method outlined to delimit their current uses and the nature of the input-throughput-output process and results that obtain for each. It will set out the underlying questions that each method helps to raise for the individual and suggest the logic each has for the examination of the next.

Long-term planning efforts lack quantifiable data to manipulate in deliberations about goals. The value of this proposed approach to the several non-data based methods is that the questions one might reasonably ask of the long-term future can be of greater value than the answers to them: answers have a truth condition that questions do not. The questions, when arrayed as a set of focusing devices, may work to clarify concerns and to help assess strategies with respect to chosen contingencies.

When long-term planners assess their several goals against the goals of competing advocates in a focusing environment, they may discover more completely the impact of their ac-

tions on the lives of men. When that assessment is made about moments in the developing future when their goals have been attained, the focus of questions they address may reduce the ambiguity of the unknown to manageable proportions, while leaving the maximum number of choices open to developing generations.

INTERLUDE

Posit an institution--a university--with a long-term goal such that if attained it would seriously alter the university's make-up, the role it plays in the community, and the way it is perceived by the society as a whole.

Within the institution a planning department exists responsible for causing the goal to obtain through the specification of certain strategies and the instigation of certain actions.

The pursuit of a goal that will alter the make-up of the institution will affect several populations in several ways. During that period of time when a strategy toward the goal's attainment is pursued, extraneous events not causally linked to the strategy or goal will certainly occur and may or may not impact on the strategy or goal.

The planners see the several affected populations as holders of relevant information for the specification of strategies and in determining the values there may be in pursuing the goal.

The process of collecting, tabulating and assessing that information such that it has value to the long-term planner may be carried out by systematically collecting certain focused bits of information.

Further, the self-interested opinions and information might supply a plausible, probable and internally consistent environment against which the long-term planner might if he so chooses assess his strategy alternatives. The proposed goal must obtain in the unknown future. For the planners to examine their strategy options they must suspend their disbelief.

CHAPTER II

DELPHI: A TOOL FOR DEVELOPING FUTURE ENVIRONMENTS

THE DELPHI TECHNIQUE

The Delphi Technique is a process for eliciting and refining the opinions of a group of individuals. The individuals remain anonymous to each other, their opinions are continually refined and reiterated, and feedback to participants is controlled. The process is believed to produce either converging group consensus or the polarization of views (Dalkey, June 1969, p. v; Gordon, September 1969, p. 3; Helmer, September 1969, p. 2).

The Delphi Technique is a variant of the panel or committee approach for arriving at a consensus or majority opinion. Its design eliminates face to face confrontation as experienced on a panel or committee. Presumably, it prevents specious persuasion, individual unwillingness to abandon publicly held positions, and the bandwagon effect of a majority argument. It replaces direct discussion with a series of carefully controlled questionnaires that report back edited opinions and new information to the participants, where they act in privacy and react to the successive inputs. A committee or panel report is replaced by tabulated data from the several respondents, from which the Delphi coordinators make their interpretations and analyses to arrive at a series of forecasts, opinions, and occasionally scenarios in place of an expository report.

The major proponents of the technique--Normal Dalkey, Theodore Gordon, Olaf Helmer--accept the decision-maker as the purchaser of expert opinion. They argue that when questions asked are in the long-term

future, are complex in nature, and are subtle in their relationships, one expert is inadequate. They assume that many experts are better than one and that experts as a group will exercise careful judgment in their deliberations. A consensus is sought, rather than an array of self-interested responses.

They also speak of the method as a proven technique (Gordon, September 1969, p. 3), that it generates consensus as does a panel when long-term forecasts are in question. Further, it is claimed that the output of a Delphi provides the basis for subsequent planning, action, and analysis (Gordon, September 1969, p. 4).

The purposes of the Delphi as it exists are believed to be:

- the elimination of certain negative aspects of panel responses while collecting the opinions of experts.
- the generation of consensus opinion about certain events.
- the generation of information--through the use of a group of experts--of greater or more reliable value than any one expert could produce.

Delphi is purported to be:

- a tool for forecasting
- a basis for long-term planning, action, and analysis
- a device for eliciting careful judgment
- a way to get output which supplies a seemingly coherent structure for testing alternative contemplated actions (Gordon, September 1969, p. 4).

The device has been used as a forecasting process leading directly to plans in the areas of political alliances, technological potentials, war prevention techniques, economic indices, and medical developments. The Delphi is a valuable technique for planning and forecasting the long-term future (Gordon, September 1969, p. 4).

The concern of this study is to determine what questions it helps the long-term planner raise. The process and the results that obtain should expose those questions and clarify the applications we might agree the tool has.

The basic Delphi process involves a series of questionnaires. The first questionnaire is a list of future events chosen by the coordinators of the Delphi or their employers. This questionnaire is distributed to the participant experts who are also

chosen by the coordinators or their employers. Each participant expert is asked to indicate when they think the event will take place and indicate how familiar they are with the item, then to suggest additions to the list of events. The question of the time horizon for the event is concerned with a probability estimate as well. That is, for each event the respondents supply a date for 10% probability, 50% probability, and 90% probability, thus estimating the earliest possible date, the date most likely, and the date before which the event almost assuredly will have occurred. The Delphi coordinators tabulate the results of the data from this first round of questionnaires and edit the additional events suggested.

The second questionnaire is similar to the first with the addition of the suggested edited events. Displayed with each event is the individual's own response, and the inter-quartile range of responses generated by the entire group of participants. Each participant is asked to justify why his opinion is outside the inter-quartile range if it is, and/or shift his estimate if he so chooses. (In certain variations, the second round asks for important societal and technological changes or consequences that may occur because of the event [Gordon, September 1969, p. 17]) without any temporal information. The coordinators then tabulate a new inter-quartile range and edit the reasons given for opinion shifts. (In some

cases, where no shift occurs, the event is deleted from successive rounds [Helmer, April 1970, pp. 10-11].)

The reasons for any shifts and the new inter-quartile range are returned to the participants as round three. The participants are asked to examine the reasons given for opinions outside the inter-quartile range and to shift their date if they so choose. (In variants as described above, the process of stating opinions and reasons occurs in this third round along with a value assessment concerning the effect of the event on society.) The coordinators tabulate a new inter-quartile range and it is returned to the participant with his previous estimate.

The fourth and final round asks the participant to address, for each event, any or all of the following questions:

- What are some of the consequences of the event's occurrence?
- What methods of control might be feasible to prolong, prevent, or enhance the event's occurrence?
- What are the social consequences ('very favorable' to 'very detrimental') which may result if the event occurs?

The coordinators analyze this data to construct scenarios of future blocks of time spanning 10-25 years.

Note: This is only a description of the most common Delphis. There is nothing that limits the number of passes or the questions asked.

The terminal display of the Delphi exercise is generally a series of scenarios reflecting the Delphi coordinators' interpretations of the inter-quartile range data, a listing of the events with the final inter-quartile range for each, and other edited information of the participants.

Considering both the purposes of the Delphi and the assumptions that underlie it, we might ask if it can be accepted as a planning tool or merely as a useful set of questions.

In the final tabulation of the opinions generated by the Delphi, the only opinions dealt with are those within the inter-quartile range of responses. The inter-quartile range reflects only the opinion of 50% of a group. It is not a majority opinion. A panel of experts confronted with 50% agreement might deliver a majority opinion based on the chairman's vote and a minority opinion or opinions reflecting the range and reasons for dissent from the majority. Although not specifically excluded in the process,

historically, the Delphi coordinators do not supply minority reports, even though the consensus reported represents not agreement as to a date, but rather the span of time within which the middle 50% of respondents fall. It is difficult to accept the "consensus" idea when only 50% of the respondents are reported, nor can the importance of the lack of a minority statement be dismissed in assessing the Delphi as a forecasting and planning tool.

Who is an expert on the future and is a group of experts necessarily better than any one expert? Delphi proponents admit that general expertise about social affairs is next to impossible to locate in any one man, and that expert agreement in general or specific areas is difficult to reach. The input to the Delphi is always drawn from a group of what are constituted as "experts." Expertise is a descriptor attributed to someone, not a quality one can ascribe to himself. A person can claim to be knowledgeable about a field, while others may ascribe the status "expert" to him, based on their perceptions of his knowledge base. However, knowledge about the future is non-existent. The future is a mental construct each individual develops in his own mind (Wolfson 1969, p. 1.3).

A claim of expertise about events in the long-term future may be predicated on the knowledge of some goal or planned series of events. Without a knowledge of the strategies and goals of the planning group which asks the Delphi questions, it would seem dif-

ficult for the respondents to supply accurate judgments on or a useful focus about events posited in limbo.

Is the Delphi a forecasting tool? A forecast is an opinion about the future. One-half of the opinions given in a Delphi are considered the aggregate forecast of the group concerning an event's occurrence. Is it a planning tool? A plan demands the specification of a goal or the end to be reached by that plan. With Delphi, the plan is not supplied to the experts before their deliberations and the events are not internally linked to any goal or strategy. It would seem difficult to assess a plan based on the opinions of men who were not aware of the plan prior to their deliberations.

Can the experts be assumed to make judgments carefully? No evidence exists for this claim. Nor does consensus of one-half of a group represent careful judgment in arriving at that consensus.

Is the Delphi a seemingly coherent structure for testing alternative contemplated actions? The events are not focused against a plan and they are not linked to the present in any plausible way such that a planner could pursue a strategy assessment against them.

The questions asked of the participants explicate doubts about careful judgment responses. It seems unreasonable to ask

respondents to make a value assessment concerning an event without knowledge of the entire social fabric surrounding the moment of the event's occurrence, their own place with respect to that future moment, and their personal goals for that moment.

In spite of all these weaknesses, we might reasonably ask if the questions asked and the responses generated through a Delphi do supply information that can be useful in long-term planning. The process involved in the Delphi Technique could become a valuable tool for planning if we assign to it different values, and reconsider the population comprising the "expert" input. We know that the process focuses the respondents' attention on an array of possible events in the future. Depending on the variation, it demands that they detail a date, a probability estimate, a desirability quotient, a list of perceived consequences, and an explication of a possible way to control the event's occurrence. These opinions or perceptions about isolated events in the future may have value for the planner if the assessments are made with some reference to a plan, a strategy, or a goal.

With knowledge of a goal, the Delphi may be used to create a chronologically linked series of conjectured future events which can be seen as a "future environment." This is an outcome proposed by the Delphi proponents. But in order to do this well (i.e., specify a future environment), several changes in the Delphi

as currently conceived would be necessary. The opinions of participants must be focused against a previously proposed plan or goal that stretches across the time span reflected by the events in question. The anonymous opinions about events might then be set against personal value assessments about the plan, strategy, or goal itself before the exercise begins.

All attempts at long-term planning for the future are attempts to structure the unknown. We try and reduce the unknown quantity of the future by filling the void with our plans. Plans are made in pursuit of goals for some moment in the future. The moment of their attainment and the present are the parameters of the time interval we concern ourselves with when we try to assess our plans. The Delphi Technique is assumed to help us structure events that may occur during that interval. This is thought to be possible by an examination of events that might occur during the interval.

Most events are the result of human actions and reactions. Men believe that the environment is controlled by specific actions. If we think of future events in terms of who might act to make them occur we might think of them as goals. We might say that future events are similar to goals in that they are the 'not yet occurring states of affairs' that to occur must be aggressed

for by someone or some group. This idea may have value in clarifying our use of the Delphi to assess our plans against.

If we assume that goals are a type of future event, and that for a goal to obtain a strategy must be pursued, then we might argue that for a future event to occur some strategy must also be pursued or some condition allowed to exist such that at some point in the future, it seems likely that the event can be made to occur. We might agree that allowing a condition to exist is a strategy if we consciously recognize the outcome it might produce.

To know that an event, X, may occur in the future and that the event may occur between now and the moment of occurrence of another event, Y, is not sufficient information to judge the impact of event X on Y. We must know the strategies to Y that will be operational at the moment of X to estimate an impact. We might say that the strategy followed in the pursuit of Y is comprised of a series of other, secondary, events/goals. It is these interim events that can give us the perceptual base to make opinionated judgments about specific events that we examine with a Delphi process.

Plans, goals, and strategies for a society affect subsets of that society in different ways. Those self-interested subsets might reasonably be perceived of as the several experts about the

plan, strategy, or goal. It is against the proposed actions of a society that societal events must be weighed. Men in the aggregate don't make plans and pursue strategies toward goals, rather individual men representing individual institutions do

Without seriously altering the process of the technique we might alter the nature of the inputs and the population we request to input. The persons in the planning department are certainly expert concerning their desires. Their opinions must be integrated into the feedback system the Delphi supplies. The experts, that is, the persons comprising the respondent population are the several populations who are in some way involved in or affected by the pursuit of some goal. All persons are experts in their own opinions about the value of any goal. Different persons may have radically different opinions. Thus they cannot be seen as an aggregate from which one might extrapolate directly a consensus opinion about events relevant to those goals. To disaggregate the several subgroups, the inter-quartile ranges of the several expert/interest groups could be displayed to allow the planners to assess perceptions of those subgroups about events and their impact on the plans over time.

Further, these goals are pursued through strategies. For any event, some group or groups have the power or authority to instigate a strategy which will greatly increase its probabil-

ity of occurrence. The opinion of individuals involved in a Delphi exercise may be predicated on their perception of the probable actions that may be taken by men with authority to cause the event's occurrence.

If the last question asked of the several expert/individuals (What controls might be possible for this event?) was replaced with a question that asked: "What subgroup of those involved could control the occurrence of the event and how?" we might generate information for planners that would help them in their allocation of resources. In pursuing a goal affected subgroups may have to be convinced of the merits of the goal. They may hold a misperception about the goal or the strategy to the goal that can affect the goal's attainment. Energies may have to be invested to convince these groups. A knowledge of the perceptions of the several groups and the opinions about the power base for each event in question might focus the planner's attention and energies in those areas where the most opposition or misunderstanding exists. It may also conserve energies by identifying where they are not needed.

If certain subgroups to be affected by a plan believe certain events are in the planner's control and agree with the goal, he need not waste energies convincing them of the event's value. This focus on perceptions of power might help the planner

determine what groups need information to allow his goals to obtain and be beneficial. These modifications point to an altered use of the Delphi only hinted at by the designers. That is, Delphi can generate a framework of events against which to assess plans.

The events examined in the Delphi might be displayed along a time line spanning that period of time between the present and the moment of goal attainment. We might call this a future environment. For this chronology to have a high enough plausibility that planners would attend to it, it must be internally consistent and probable. A future environment is an agreed-to construct of a period of time that has not yet occurred--a period of time that starts with the present and runs forward to a date in time that is beyond the moment of a goal's attainment. The future environment involves a series of moments in time against which we locate conjectured events. A series of events that, taken together, are neither implausible nor inconsistent may be considered a set of givens that planners temporarily agree will act as exemplars of the types of events their strategies may confront. It is against these events that they assess their strategies and goals. If each subgroup of experts were represented by a different inter-quartile range during the successive questionnaires, and their several opinions of power sufficient to cause the event's occurrence were requested, those events that all subgroups perceive of as occurring at approximately the same time and

with the same power base, might form key pieces of the chronology. Events that conflict with these are temporarily discarded. The remaining events, those which the Delphi respondents did not agree on, are located on the chronology based on the planner's assessment of the power base for each event. The plausibility of the event would be more recognizable based on the value ascribed to the event by the group who could make it obtain. To this chronology could be added those events that fill out the future environment to reflect plausible links to the present.

When these events are so arrayed we might call them an intellectual playground, an environment which the planners agree they will consider exemplars of a future that will affect their assessment of their plans, strategies, and goals. A future environment exists at the whim of the planners and reflects the perceptions and opinions of the several groups of individuals that may be affected by the planners' actions. A future environment has the advantages of including the input of relevant populations affected by a plan and is predicated on human desires and self-interested perceptions of the future. It plausibly links a future moment--a moment when a goal may obtain--to the present. It confronts the goal and its strategy with a series of impinging events that the planners agree are internally probable and consistent with their knowledge.

In effect, they now agree to suspend their disbelief. The questions the Delphi helps long-term planners raise for themselves with relevant others may be a plausible framework against which they might plot alternative actions they propose to take and the strategies they would choose to use toward a goal's attainment. This incremental specification of plans forward over time against the future environment they agree to allow to impact on their plans may help carry them into future time with a clearer perception of the time spanned. This first step assessment then occurs against specific events in time and not against "the future."

INTERLUDE

Posit an institutional planning group that has constructed a future environment as described above.

Against this chronology of future events they then specify incremental strategies forward in time toward the goal that they propose to operationalize. Their effort has them confront a series of external events that may or may not impinge on their hoped-for success.

When their efforts allow them to reach a moment in the future when their goal obtains, they have experienced an examination of certain causal links that may be sufficient conditions to alter their planned future activities. By suspending their disbelief they assumed the reality of the events.

They develop a series of "future memories." An opportunity now exists to seek out causal links that may be visible only upon reflection. They write individual "future histories" based on their "memories" of the future.

From these several individual histories alternative futures emerge that specify each individual's perception of the impact of events on each other throughout the time spanned.

From these several histories scenarios of select moments in time can be created showing alternative views of the future conjectured.

CHAPTER III

EXPOSITORY METHODS

A. FUTURE HISTORIES: A TOOL FOR ROLE MOMENT ASSESSMENT

B. SCENARIOS: A TOOL TO EXAMINE MOMENTS IN TIME

A. Future Histories: A Tool for Role Moment Assessment

The writing of future histories is a simple expository exercise. It is a reflective effort. The process is similar in certain respects to the writing of reports or histories of personally experienced periods of time. The writing of any history is an attempt to bring into awareness and integrate for oneself the many isolated events that occurred during a period of time and their impact on the period experienced such that today could be no other way. A future history is meant to clarify for the writer his feelings, both reflective and intuitive, about causality to help him order and assess his assumptions about the future.

Because men write histories, different histories will be written about a common theme against common extraneous events. The particular impact of identical events on different men's goals and plans at any moment in time will be different, unique, and profoundly important to them in their various assessments.

Histories are the insights men have concerning the necessary causal links that were the means and ends of a period examined. The necessary conditions for certain events are pointed to. The historian's perceptions of the dynamic interactions of many events in time are detailed. A world at one moment in time is contrasted

with a world at some other moment in time and the intervening events are examined to try and specify how and why change occurred.

An environment of the future spans time. It encompasses a world we know (the present) and runs forward to a world we care to know (the moment of the goal's attainment). We posit our goals and say we will alter certain variables through the effect of a strategy, such that the attainment of the goal will make the world a better place in which to live.

When science fiction writers or other futurists try to posit a future world emerging from our current society, they write histories of the future. One approach that can be used is to posit a future moment in time and alter a significant reality of the present. They examine the present to determine what it would be like with that variable altered and certain goals achieved. They ask: What things

- might be possible only if it were true
- could only be possible it if were true
- would be probable
- would be good or bad

as a result of a decision to pursue a goal today, such that a different future obtains. The relevant intervening moments between

the present and the moment of goal attainment are then filled with the events and activities that might be sufficient to cause that goal to be achieved.

One outcome of writing a future history seems to be to help individuals responsible for planning social changes to recognize more clearly their role as members of the society and not as elitist beings in some unaffected world. Future histories serve the function of helping individual planners view the long-term future as a series of moments in time. They will live with and through this span of time.

In the writing of future histories, certain restrictions and guidelines are specified to focus the planner's response.*

- He must deal with the time span examined in the past tense.
- He must posit his plans, and goals pursued, as occurred states of affairs.
- He must date as many specific occurrences as possible so that he knows where in time and

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* Operationally, the process of writing future histories has been exercised in at least one instance in the Maxwell International Development Seminar in 1969 (a simulated environment dealing with a time space of 1970-1990 constructed by the author). Participant planners were asked, standing as themselves in 1990, to reflect back on their experiences during the past twenty years--1970-1990. They had reached 1990 by incrementally operationalizing strategies towards a series of future goals. These strategies were based on the impinging events that comprised the simulated environment, an environment constructed from a Delphi.

space the event occurred in reference to all other events.

- He must posit a future present role to explain to himself why he is writing these "memoirs." Examples:
  - I am retiring.
  - My replacement requests an overview of the institution's involvement.
  - I am transferring and am fascinated by the developments I experienced during the past 20 years.
  - I am trying to describe to my son/daughter/ or some relevant other why today is necessarily the way it is.

To develop a plausible series of causal events, the planners must suspend their disbelief. They treat the future they posit as an occurred reality, then reflect back to the present to conjecture how it came to be. The strategies, the beneficiaries, the goals, and the decisions that would be sufficient to make it occur are explicated to their satisfaction. Their satisfaction is defined as a continuing state of suspended disbelief.

Though we see the past, and the causal links in the past, as that set of relationships that, having occurred, seem now necessary conditions of developments to the present, when they occurred they were only sufficient. Inference from necessary condition to sufficient condition is a timeless fallacy (Dietl, Spring 1970, p. 7). It is not the same with the future? Causal links about the future are only sufficient conditions. They are not necessary conditions.

When planners extrapolate the causal links of the past in an attempt to plan strategy for the future, they must assume that what now appears necessary in the past will be necessary in the future. However, when we plan a strategy for some future moment when our goal will obtain, and when we do so without reference to the causal links of the past, we detail one set or series of sufficient conditions for the occurrence of the goal.

A necessary set of conditions implies no options. It posits the way a chain must develop. A sufficient set of conditions implies the availability of options. The purpose of writing future histories is to integrate a planned strategy through time with a future environment of that time to assess the several discrete units of activities and events that were dealt with as one set of sufficiencies.

Time is dynamic. Moments are linked by a causal chain of events. The relationship we posit when we reflect back on time are of a different kind than when we assess our plans forward to a goal. When we place confidence in our evidence of the past to extrapolate causal links to the future we are assuming that the links are necessary links--necessary conditions. We cannot assess the links in terms of alternatives unless we see them as only sufficient conditions when they are planned to have occurred.

If the purpose of examining the future is to assess our alternative strategies, then we must deal with them as sufficient strategies that are amenable to alternatives. Reflections on past causal links as necessary conditions in any future history is a logical fallacy and delimits our freedom to posit alternative sufficient conditions for the future and the strategies that we pursue toward goals. If we concern ourselves with interactions of events through time as sufficient conditions, each individual may bring to light alternatives not posited by others while assessing his incremental plans forward through time. We impose the past on the future when we extrapolate the necessary past into the necessary future.

Although assessing plans forward through time is cognitive/intuitive, the historical assessment is reflective. Each type of

assessment starts from a different knowledge base. In the assessment of a strategy forward through time, we tap the memories of our past and all those "future memories" we generate of the strategic interactions posited during the planning exercise. When we write a future history from our role as we conjecture it in that future, our assessment of the time spanned draws on our total memories; we draw on our memories of the past which include our memories of the future.

B. Scenarios: A Tool to Examine Moments in Time

A scenario is generally thought of as synonymous with future histories. These terms are used interchangeably in futures oriented papers and books. The word "scenario," as used in a futures context, is generally attributed to Herman Kahn of the Hudson Institute.

In the logical fit between methods being developed in this paper, it is appropriate to separate the 'scenario' from the 'future history' as a procedure to see if it behaves differently when we ask it to do a specific set of things. If it does behave differently, then a separation of the two ideas may allow a crisper analysis of a future conjectured world for the purpose of assessing goals.

I shall take the view that the purpose in constructing scenarios is to examine discrete moments in time. In these moments we can begin to assess policies towards goals and to examine those goals in the long-term future in a way for which straight trend extrapolation is inadequate.

When scenario and future history are considered interchangeable, the construction of a scenario or future history taps the reflections of one individual. If we disaggregate the two ideas and let the future histories be constructed by several individuals, as histories usually are, we might then construct scenarios from the set of histories written about a common period of time.

It might be useful to see a scenario as a plausible picture of a moment in time drawn from the several histories of that period. We do not experience history as a set of causal links, rather we are confronted with moments in time and each subset of the society reacts to those events in their own way. We write scenarios to give us the perspective to examine how men might respond to events in select moments in that continuum.

The process of scenario construction begins with the specification of a checklist of those aspects of society which we must delineate to form a framework allowing the assessment of

specific moments in the time continuum. Another reason for constructing scenarios is to specify causal links (Kahn, April 1966, p. 24).

The checklist information includes trend data extrapolated into the future. When data of this type are extrapolated into the long-term future, the accepted margins of error set parameters for the data. Their usefulness may be called into question when these parameters are expressed in most optimistic to most pessimistic terms. These parameters are generally above and below a unilinear projection. If we assume the variables projected are necessary, a straight line projection is similar to the functional dependents in use today. These data are not useful to posit alternatives because the parameters are mathematically correct but are based on a belief in necessary causality. They are useless since they are not reflectors of non-data based options--options specified through human deliberation. A crisis or goal is posited as occurred and the checklist of data is tapped to fill in the probable effects of the event at the moment of its occurrence.

If we use future histories to specify the causal links as seen by the several men assessing a strategy, we might see the scenario as a tool to examine specific pressure points or branching strategy points at precise moments in the time continuum.

A scenario could be constructed of a moment in the future by examining the several histories or viewpoints of people who lived and wrote in that time frame. The scenario is then drawn from the several novelists, editorialists, essayists, historians, demographers, economists, politicians, diarists, anthropologists, and interviews with people who "experienced" that time period. These several evolved histories supply the material for assessments of frozen moments in time.

When one writes from his own role, his experience base is self-centered. The several planners involved in the exercise of writing future histories will designate differing causal links for certain events. For other events, they may specify the same causal links. These common perceptions might form the basis of the several moments in time that demand greater clarification in the assessment of alternative actions towards a goal. A commonly perceived interaction may be based on a perception of necessary causality. Such common causal events can be examined to determine if in fact the coincidence demonstrates high plausibility in the conjecture or whether the causal links have been seen as necessary. Hence common perception of impact, like any consensus or convergence of opinion about the future must be suspect to determine if the perception is based on the group's belief in necessary causality.

The several perceptions of individuals about links over time are the backbone of alternative assessments. A central

scenario of the moment might be constructed from several histories with alternative scenarios supplying the parameters for the assessment of a moment in time. Alternative scenarios are written in order to break the presumption or belief that a most plausible scenario of the future is similar to a necessary scenario of the future.

When a scenario lists causal relationships as to why a state of affairs came to be, it is in fact a history. A scenario is historically free. It records only what-it-must-have-been-like for various subgroups of the society at some moment in time if certain interactions existed. This 'what-is-must-have-been-like' demands that several histories have been written such that the several perceptions of men can be integrated in a scenario. Through this disaggregation of the several future histories, commonalities and disparities can be identified. The disparities demand the existence of alternative scenarios. One belief about the future is that it is not knowable. The writing of one scenario is inadequate. The several histories allow the construction of several alternative scenarios. The possibility of only one scenario would imply a belief that the causal links are necessary rather than only sufficient.

Scenarios written from checklists of possible events do not reflect the feelings of people who must confront the period of time examined. When they are written in isolation by one indivi-

dual without an array of human input, they are no more useful than science fiction. At best, it is one man's reply to a set of questions.

When we build a future environment from a focused delphic exercise and accept its event descriptors as temporarily useful exemplars of the types of events we may face in a chronological future, we build a useful playground in which to assess our goals. If a planning group suspends its disbelief and accepts the environment they have constructed, they can plot their several proposed strategies incrementally over time against that array of chronologically linked events.

Having lived through this future period in the pursuit of their individual goals, they have developed a knowledge base that includes their memories of that future--past. That base in the future and their memories of the interaction of selected events allows them the confidence to reflect back on their efforts and write their several future histories.

The several perceptions of these individuals span the same period of time and specify various impacts not seen by all at various moments in time. These several alternative perceptions demand the construction of several scenarios of those moments in time to clarify the several strategies that are sufficient to

reach a goal. The sufficient causal links that seem detrimental to certain segments of society can be assessed in detail to posit still other alternatives for a better world for men.

INTERLUDE

Posit an institutional planning group that has constructed a set of scenarios about moments in the future when their planned goals will obtain. Up to this point in the exercise, the goals pursued by the several individuals have been accepted at face value by the participant planners, e.g., they have been accepted as legitimate, but, as yet only in their cliche format.

The goals have been refined to a point where the aggressing planners believe they know what the goal means well enough to solicit support for its pursuit. At this point the cooperation of others is necessary. The planners must be willing to display their goals and strategies to them for a more serious and complete scrutiny.

To accomplish this task they must translate the goal into the concrete implications for the society at the moment of the goal's attainment. To do this, the planners might outline their understanding of the implications contained in the pursuit of the goal. They must specify the reflectors of success in attaining the goal, and place them within the scenarios of the moment of the goal's attainment. The values probably held by

individuals in a world reflected by the scenario and the value shifts implied if the goal is pursued through time might also be delineated.

This examination can be called value shift assessment.

CHAPTER IV

VALUE SHIFT ASSESSMENT: A TOOL TO EXAMINE GOAL IMPACT

Before we go any further, let us recapitulate to focus our attention. First, we argued that if the future is unknowable, it may be absurd to try and know it. To limit the absurdity claim, men must be willing to suspend their disbelief and deal with exemplars of a plausible future world against which they might assess their goals when planning.

We then argued that our goals are 'not yet occurred' events--that goal statements cannot be seen in limbo because their occurrence will affect different groups in different ways and they will be pursued by a strategy comprised of intermediate events and that strategy itself will also affect people.

We argued that the strategy to any goal will be pursued through time and can be detailed incrementally. We argued that this process is one that demands suspended disbelief in that each incremental move forward assumed that the individual trusts his last action and stands on it to move forward in time. He develops a set of memories of the future that he trusts as occurred. He can then reflect back on those interactions he posed and trusted to see what the sufficient causal links were and to posit alternative links that would be sufficient at any moment in that time to allow the goal to obtain.

We then argued that specific moments might be assessed to see how different people see different events affecting them. Their roles at any moment in time will include values and they as individuals will value certain things at different moments in time.

The task now, however, is to ask of the goal what its attainment means in terms of shifting values at the moment of its occurrence. One of the most profound realities of the last half of the twentieth century is the speed at which values are changing (Toffler 1969, p. 2). When individuals adopt goals for the long-term future they are pursuing a value or attempting to sustain a value currently held by trying to promote or reconfirm its existence in the future. We might think of goals set for the long-term future as an attempt to attain or to sustain some value (Rescher 1969, p. 5).

It has been argued here that goals, if they are achieved, occur at a moment in time. The strategies to those goals are pursued through a continuum of time. It was argued that the strategy and goal cccur in an environment comprised of individuals and impacting events. The environment spans a period of time while the events occur at select moments in time. It was argued that histories of the possible interactions between events and strategies could be written about the continuum of time, while scenarios could be constructed of select moments in time.

Though values are held during any moment in time, they shift over the continuum of time. When individual planners examine goals, they must examine the values on which their selection was based (values can be thought of as an ordered set of preferences sustained by a belief system). A knowledge of what these values are is important. Similarly, an assessment of the values possibly and plausibly held at the moment of the goal's attainment might be made. From these polar examinations the shift in values over a period of time should become visible.

The individual planner has an opportunity to examine what values might likely be held when the goal obtains, what values may need to exist for the goal to be seen as beneficial when it obtains, what values he or his institution currently hold or wish to sustain such that the goal is posited as worthy of the investment of energies, and finally what the shift in values over time may imply for enhancing or retarding a strategy he currently plans on pursuing.

Kurt Baier and Nicholas Rescher of the University of Pittsburgh are responsible for a major effort in the area of value assessment. Their work in the area of values reported here was conducted primarily in 1965-66 at Pittsburgh. Their concerns are with the values implied in and caused to occur by the pursuit of technologies unknown in the past. Their aim first was to develop

a clarifying system to improve the conceptual apparatus for talking about values and value change (Baier and Rescher, 1969, pp. 33-109).

Kurt Baier defines a value, essentially, as an attitude for or against an event or phenomenon, based on a belief that the value benefits or penalizes some individual group or institution. He feels that it is manifested in behavior and is observable. It is not intrinsic to the object itself (Toffler, 1969, p. 6).

Baier and Rescher talk of values in terms of cost benefit theory. Alvin Toffler, in Baier and Rescher's book, argues that what is urgently needed is a kind of cost benefit accounting--one that concerns itself not merely with the practical consequences (read "if-only") of technological policies, but with their potential consequences for shifts in values, e.g., preferred behaviors, as well.

Goals for the long-term future are adopted on the assumption that their attainment will benefit men in that future. Our strategies toward that future to make it obtain will affect how we perceive the goal, e.g., how we redefine the behaviors which manifest the goal's attainment. Men deny themselves certain valued experiences in the pursuit of grand goals. I argued in Chapter I that men pursue goals for a better now so that when it obtains in

the future, that which they valued in the present when they posited the goal is no longer of value to them. Some goals or the strategy pursued for their attainment cause unexpected values to occur, while other values shift independently of pursued goals.

Baier and Rescher have developed a vocabulary scheme to discuss this rescaling process. Much work needs to be done in the area of value shift. It is enough for our purposes to ask planners to examine their goals in terms of the values implied in the goals' attainment; and to assess their goals against conjectures about a possible shift in values by the time the goal has been attained. As committed individuals, the exercise compels planners to assess their goals against scenarios of the moment of the goals' attainment and the strategies to it. That is, the goal, a type of event, is not a static entity. Men will believe it serves that purpose only if they value it when it obtains. Values shift over time and are reflected by our changing reactions to events.

Value shift assessment for the operational long-term planner need not be unnecessarily rigorous. If it were, he could not reasonably operate and, further, the language with which to deal with value questions is still in its infancy (Baier and Rescher 1969, p. 29). He does need, however, to ask four basic questions to examine his goals and the values they imply for the future. The

process a planner experiences can be related most clearly with an example and instructions. I cite the exercise developed for the Maxwell International Development Seminar.* The mode of inquiry is as important as the inquiry itself. This is a set of questions to help individual planners organize their thinking about goals for the long-term future:

- What are the reflectors of the goal's attainment?
- What values are implied in the goal's attainment?
- What values are probably held now?
- What value shifts are implied in pursuing the goal?

Preceding this step in the exercise, the individual planners had constructed a future environment that was drawn from a Delphi-type exercise. The events they chose to include in the environment were those they agreed were at least internally consistent, plausible, and possible. They had been asked, then, to plan incrementally forward over time a strategy or set of strategies in the pursuit of some goal or set of goals in their area of expertise: agriculture, education, health, etc. It was pointed out to the participants that when incremental planning is carried out in the pursuit of goals, the strategies chosen must be trusted and believed sufficiently, such that you can build on

* The Maxwell International Development Seminar was a 30-day re-orientation program for staff officials of the Agency for International Development of the U.S. State Department on overseas assignments in several areas of concern. The Educational Policy Research Center at Syracuse contracted to construct a planning exercise (MIDSIM) to help focus their attention on long-term planning.

that base of knowledge. This process generates what we have called memories of the future. They were then asked to reflect back on their twenty year long future experience and write a history of that future-past.

Scenarios were constructed of various moments in time from the several histories and made available to the group. It was pointed out to the participants that when planning proceeds forward, the plan must start in the present. We discussed the nature of the several goals they had reached in 1990 and noted that none were significantly different than the present. We suggested that it might be interesting to posit the nature of the world or worlds they might like to have in the future--at 1990--without first specifying the causal links to that future. The participants posited drastically altered worlds at the utopia level and were then charged with extracting from that future world a goal they would like to pursue. The goals they chose were consistently more grand than those they reached by planning forward in time. It is at this point that the following charge was introduced to make them assess their goals more specifically than the abstract cliches in which they were originally couched. The effort is a prelude to the development of a strategy to the goal.

In the Maxwell International Development Seminar, participants were given written instructions explaining procedure and

purpose for each successive step in the exercise. The following excerpt from the goal and values step illustrates the type of questions participants were forced to confront.

> You are not making plans. You are thinking about the impacts of your ideas that become plans and goals for the future. The ideas you commit to paper are not binding. You are playing around with ideas. We hope you will have fun doing it. Instead of striving to reach a tangible short-term goal, like building a bridge, a plant, a road, a bomb, etc., you will examine the value of the goal itself. We are forgetting as best we can, and asking you to try and forget, the real importance of your roles. Today behind these closed doors we are asking you to examine your ideas for the future. No idea or goal is too silly to bring up and no one should feel that they are expressing policy when they speak. Today you are all individuals stripped of your titles trying to think in a new way about the future goals you are considering pursuing.

Your goals read like the following:

- Adequate diet for everyone
- One car in every family of three
- Inflation rate of 2% per year
- 10% of the nation involved in agriculture

From these goals, and to help clarify what you mean by the goal's attainment, you will specify some reflectors of successful attainment of the goals, or ways to the goals.

For example: "Adequate diet for everyone," if it occurs, would have as a reflector--10% of the population trying to lose weight and malnuitrition considered a rare disease. Many other examples exist.

Once you have a reasonable goal stated and have thought through some reflectors of its success, you must examine what people might value at the moment of the goal's attainment. If we return to our goal of an "Adequate diet for everyone," we might have people valuing staple foods less. They might value cleanliness in food distribution more, they might insist on packaging, they might want more luxury foods, they might be dissatisfied with the refrigeration and cooking facilities they use, because they no longer have concern about food itself.

They might find the "adequate diet" goal to have been reached with dinner, breakfast, and lunch pills, eliminating the three family meals a day, further reducing the opportunities for families to gather over food and talk each day, devaluing the family unit, or its inverse. There are many values they might hold at that moment because of, or in spite of, the goal. Some may not be in the best interest of a nation. We see examples of this all around us--some value shifts are good and others are unforeseen and bad. We tend to ignore the bad until it is too late and that is why we play with it here.

Now a different value in that future moment implies something is valued today differently than we see it being valued in the future so that it must be shifted. To determine this, we must examine what probably is valued today.

Your fellow planners will have their opinions and you yours. Examine your several views. Finally, how do you think the shifts from today's values to those you see might arise, would occur? Change can come about through several means.

Your goal may imply value shifts that are more negative than you had originally thought. Now is the time to change. That ability to change your goal is the first value of the tool. Your tasks, then, are to set goals, choose one, specify reflectors of its success, note them, note values that might be held at the moment your goal obtains, those probably held now, and probable ways the shifts would occur.

The purpose of the exercise described above was not to know what the future might be, but rather to make the individual planners, each assessing a goal of his own choosing that he personally chose to aggress for, examine the implications of the pursuit of a cliche goal statement. The participants were asked to alter their goal if at any time in their assessment and discussions they felt the goal was not worthy of pursuit.

The following is an example of the output of the exercise:

General Concern: Agriculture

Goal: Increase agriculture production to enable the nation to become an exporter of agricultural products.

Reflectors:

- People now have an adequate diet
- Small agro-industries are developing
- 50% increase in amount of irrigated areas due to completion of 4 irrigation and power dams
- 5% increase in production per acre per year
- Farm implement industry is developing to meet needs of farmers
- Increasing external demand for the nation's agro-products

Values Implicit in Goal Attainment as Reflected in Preferred Behavior:

- Decreasing emphasis on food in favor of increasing emphasis on other factors of life, such as clothing, furniture, etc.
- Lesser emphasis on family ties
- Increased awareness of domestic and foreign events
- Cash economy

Values Implicit in the Present as Reflected in Visible Behavior:

- Close family ties
- Overwhelming concern on food
- Parochial attitudes
- Dependence on locally produced items
- Immobility of population
- Barter economy

The individual planner has now had an opportunity to examine his values and goals in some future moment in time to better understand for himself the wide-ranging spin-off implications of the pursuit of a goal in the long-term future. He might now invest energy in trying to specify a few alternative strategies to its attainment by working incrementally back through time to the present.

INTERLUDE

Posit an institutional planning group comprised now of individuals who have delimited an array of plausible events that they have agreed to call their intellectual playground. The chronology of events has been allowed to impact on their plans forward through time toward several goals. Each planner has written a future history from which several scenarios of moments in time have been drawn.

The planner locates his goal in a scenario of a moment in time and has examined the reflectors of the attainment of the goal, the values implied in the goal's attainment, and the values that must shift over time.

The shifts he determines must occur over time need now be laid against his strategy. His strategy is that set of behaviors and their results that he will pursue through time in an effort to attain his goal.

We might call this strategy assessment Future History Analysis and Review.

CHAPTER V

FUTURE HISTORY ANALYSIS AND REVIEW: A TOOL TO EXAMINE STRATEGIES

Men's behavior may be thought of as a set of activities. The interactions of men's activities cause the occurrence of events. When men's activities and the events they cause are in pursuit of a goal, we might call that set of interactions a strategy. Future History Analysis and Review (FHAR) is a tool to examine the array of events and activities that may be sufficient to cause the occurrence of a goal at some moment in the long-term future.

FHAR is an idea based on concepts originally developed by Warren Ziegler, Acting Director of the Educational Policy Research Center at Syracuse, in 1969. It is an attempt to structure a dynamic planning tool that details alternative decision points in the pursuit over time of shifting goals; this allows pursuit of a changing strategy. The idea has its origin in a tool developed for the government called Program Evaluation and Review Technique (PERT). The descriptors are 'events' and 'activities.' Events occur at moments in time and can be thought of as static, while activities span time and can be thought of as dynamic.

FHAR, like PERT, is a tool that helps planners focus on the incremental behavior necessary to reach a goal. The process the planner follows in each case is to specify the intervening events and activities that are causal links to the attainment of the goal. All similarity ends there.

Although we are not concerned with PERT as a tool, and accept its usefulness in certain types of planning efforts, it may be useful to polarize its process and technique against that followed in FHAR to more clearly outline the questions FHAR compels the planner to respond to. It is in the differences that the unique value of FHAR may be most evident.

PERT is a useful tool for plotting the necessary events and activities that take a project from conception to completion. It was designed by North American Aviation Company under contract to the U. S. Government to build the Polaris missile. It is a very useful tool in organizing the activities of many diverse units of an enterprise to guarantee delivery of sub-parts at critical moments in the development of the whole product. Each unit of the whole is thought of as an event when it is completed, and the activities represent the effort necessary to bring the event into existence. The PERT Chart details the time each activity will take and the moment when the finished sub-units must be integrated into a larger unit. It helps the planner keep complex pieces of the strategy integrated.

PERT is very useful for projects where the goal's attainment reflects the end of an investment of energy. Examples of this are: a missile launched, a bomb built, a gas station open for

business, apartments completed, etc. When the goal can be stated in operational terms, the PERT exercise focuses the planner's attention on all the intervening events and activities necessary to attain the goal, starting at the present moment. A pathway to the future is detailed and treated as the set of experiences that must occur to have the goal occur.

PERT is an appropriate tool for planning a time and energy strategy toward attainment of a physical goal, e.g., build a bomb, a satellite, a gas station, a building complex. The goal is tangible and can be clearly identified as an event when all its sub-systems are installed and the unit is put into operation.

PERT is displayed on a chart. The process of completing the chart begins with the specification of events and the activities that must precede them. These activities and events are specified working backward from the goal. The causal links between activities and the events are displayed as necessary causal relationships. That is, there is not displayed an alternative set of activities and events. Alternative routes to the goal are posited only in terms of shifting time and energy allocations between events in the strategy outlined. No true alternatives are dealt with.

FHAR, while also working backwards through time, first specifies alternative sufficient condition events with no

linking sufficient activities to tie them together. For each sufficient event posited, two or more alternative sufficiencies preceding it in time must be stated. The further back in time one FHARs, the more events are arrayed in any moment in time. Events listed in the present moment must be existing events that can be pointed to as existing realities or operationally feasible in the present calendar year. Activities that are sufficient to link the events forward in time are then specified incrementally toward the goal. The purpose of the tool is to force the individual planner, as strategist, to confront the multitudinous array of starting behaviors that might be sufficient alternatives from which to start pursuing his specific goal--not to set strategy, but to assess strategy options and to confront the magnitude of the options and the impact of diverse actions on the future. The strategies having developed for himself this series of causal links, now examines the array in an effort to choose that set of activities and events that he believes to be the one he will call his strategy.

In addition, while PERT is an appropriate tool in the physical realm, FHAR may be appropriate in the social realm. The direct adoption by the social sciences of hard science techniques does not always satisfy the special problems faced by the social scientist.

One of the problems in translating a tool from physical to social sciences is that physical entities when constructed and

completed no longer demand the same type of energy investment. When a car is built, it is built. It must now be warehoused, sold, and used. In terms of the social sciences, the focus is on the driver and his ability--attitudes and techniques--rather than the car itself. The goal is the presence of a continuing behavior that we recognize as good driving. To that end a continuing investment of energy must be maintained by the aggressor for the goal (society) to keep the goal existent.

This different energy investment is critical in the choice of appropriate tools to examine goals. Physical goals, when attained, remain existent without the investment of maintenance behavior on the part of the goal advocate--that person rallying support for the pursuit of the particular goal. Social goals demand one type of energy investment to attain the goal and demand maintenance through continuance of an appropriate behavior in the society. When we cost social projects only to the moment when an exemplar can be identified and call that moment the 'goal attainment moment,' we may fail to truly attain the societal goal by not continuing investment to maintain the behavior.

The process of FHAR can be compared to a brainstorming exercise. In brainstorming, no judgments about the ideas generated are made while the ideas are being explicated. For any moment in

time as many sufficient causal events as can be thought of are detailed, back through moments in time. These are the points in time that must then be linked to each other by the specification of sufficient condition activities to cause the event to occur. By separating the two procedures, the creative exercise of event specification is not constrained with concerns about causality. The specification of events is pre-analysis. The events can be explicated as static entities. Further, the events are the self-imposed parameters of alternative possible occurrences the planner judges he must take into account. By not attending to causality at this first stage, more events can be elicited.

The activity links on the other hand, while creative, are more reasoned and thoughtfully introduced. That is, there are as many causal links as events, but the dynamic nature of activities is of a different order than the static events they bring about.

A prototype Future History Analysis and Review was operationalized in one instance in 1969.* The following chart is a schematic of the chart used in the Maxwell International Development Seminar. First events were detailed to fill all boxes--then activities were detailed to link the events. Finally, each planner chose one set of activities and events as his strategy. The strategy is that one he cares to pursue from his power base and value set.

* During the MIDSIM exercise with AID planners mentioned in Chapter III above, goals were selected after a value shift assessment was completed as outlined above.

CHART I

1970 EVENT	ACTIVITY	1975 EVENT	ACTIVITY	1980 EVENT	ACTIVITY	1985 EVENT	ACTIVITY	1990 GOAL

(*)

* The dimensions of an operational chart are at least 45" x 36" with all information located first on self adhering labels and then located on the chart surface.

As with any series of questions we ask of ourselves, the output supplies the base for new questions. The FHAR Chart is no different. If we examine the chart, we might make several observations to further break the set of necessary causality and to introduce equally important information. We argued that goals can be thought of as 'not yet occurred' events. At the moment of the goal's attainment, we can point to it as an event. In addition, all the intervening alternative events we posited between the present and that future moment, if integrated into our chosen strategy, are goals themselves. The activities link our way of behaving in our forward pursuit through time to a goal.

All events in the present moment might be recognized as occurred goals or the unintended consequences of the pursuit of goals. Many of the events listed in the present may be detrimental to the society in the present. Men do not pursue bad goals, rather they are unaware of the goal's impact on the future when they pursue it. We might think of the events listed in the present calendar year on the chart as the goals or consequences of goals of men in some past set of moments. The set of events listed in the present then may be seen as the goals and consequences of the pursuit of some goal of the past.

Noting this, we might ask planners to operationalize the process they just experienced, only in reverse--this time examining

impact of behavior (strategy) on the future moment when it will exist as an event. Working forward from a present event, alternative outcomes (events) are posited until the future moment of the goal's attainment is peopled with an array of consequences attributable or linked as possible outcomes of the pursuit of one goal. It is an exercise of this type that compels the several planners to choose wisely their strategy and consider the detrimental and beneficial impacts of their several sufficient options.

This effort concerns only one goal and its unique strategy. Many goals are simultaneously pursued with different attainment moments within one institution. The subset of events that comprise the strategy and the activities that reflect men's planned behaviors are now more clear to each goal advocate. It is only now that his goal is no longer just a cliche statement, but the reflector of the planned values and behaviors of some group of men. Now his goal can be arrayed against all other goals and assessed to help determine priorities for the institution. Men can now assess what purpose is served by the pursuit of various goals in conjunction with each other.

INTERLUDE

Posit an institutional planning group whose members now understand the implications of the pursuit of their goals into the long-term future. It is at this moment that the institution must examine the array of goals to determine priorities for the investment of their limited energies. The goal statement of each member is at best only understood as a cliche. To rally support and justify pursuit of his goal, he must make clear to the institution all those things that the goal statement implies and how the goal impacts and is impacted upon by the pursuit of all other goals.

We ~~might~~ must examine the impact of these goals with the ~~Cross-Impact Matrix~~. Certain goals will be at cross purposes with each other. We might examine these cross purposes with the Cross-Purpose Matrix.

CHAPTER VI

CROSS-IMPACT MATRIX AND CROSS-PURPOSE MATRIX: TOOLS FOR PLANNING

The Cross-Impact Matrix is a display of the output generated by a computer program that was designed to satisfy a major flaw in another forecasting method (Delphi, discussed earlier). The flaw had been recognized by the designers of Delphi and the matrix is an attempt to deal with it. The flaw is that events in a Delphi are dealt with as independent entities. No assessment of the impact of the occurrence of all other events is detailed. Of all the issues facing forecasters, the problem of event interdependency is probably the most vexing (Pardee in Gordon-Hayward, December 1968, p. 101). It is hard to posit an event for which no predecessor or influencer exists as a preceding event (Pardee, p. 101).

A general theory of cross impacts does not exist (Gordon-Hayward, December 1968, p. 101). The Cross-Impact Matrix program attempts to deal with this problem. The process is rather simple. Events drawn from a Delphi are assessed against an arbitrary time horizon to assess their probability, plausibility, and impact.

However, a continuing problem not yet effectively dealt with is that of substantive judgments in regard to filling in the matrix cells. There is ample evidence that the quality of output from a Cross-Impact Matrix is very much determined by the quality of analysis and judgment which goes into filling the cells (Ziegler, May 1970, p. 99). further, ~~[illegible]~~ Michael Folk in th[illegible] formulation and the Delphi, finds serious & apparently irresolvable problem with th especially [illegible] the influence [illegible] for it.

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Both the Cross-Impact Matrix and Cross-Purpose Matrix deal with future events. Cross-Impact Matrix deals with that subset of future events called "future news events." Cross-Purpose Matrix deals with that subset of future events called "goals."

The Cross-Purpose Matrix is a tool devised by the author to deal with goals pursued by their respective advocates. A goal is an event that is intended to occur, or, for every goal, there is an aggressor. The Cross-Purpose Matrix attempts not to replace the Cross-Impact Matrix, but to deal with a subset of future events, i.e. goals, that cannot be assessed in the same way as future news events. The first application of the Cross-Purpose Matrix was in the MIDSIM exercise ~~mentioned above.~~ * see footnot p. 64 (type in footnote from p. 64)

stop see instructor

The Cross-Purpose Matrix has as one operational rule that original probability information in each of the matrix boxes cannot be determined by anyone who is not the aggressor for the goal under consideration. Most events, other than natural events such as volcanoes, rainstorms, and in some cases even they, are sought after by someone who has as a goal the event's occurrence. The meaning of an event, the impact of its occurrence on all others, and the impact of occurrence of all other events on it is dependent on how the aggressor will behave in pursuit of his goal. This strategy is known only to him.

The second rule is that what must be examined is not the goal (which is a cliche to all but its advocate) but the strategy that must be gone through, the operations that would be sufficient to cause the goal to obtain. These basic conditional rules underlie the Cross-Purpose Matrix.

The examination of the goals themselves is inadequate. The very process of grouping under a single goal all those ways one might behave to have the goal occur tends to hide the way one will behave, and in hiding the way one behaves, one often ignores the unintended consequences and strategies which have a negative impact on other goals. What needs to be explicated and assessed are the activities and the events that comprise a sufficient strategy to bring about the attainment of that goal.

The Cross-Purpose Matrix process starts with the recognition that goals are cliche statements to all but the advocates for them. Each goal has its own advocate in the person of one of the planners in the exercise. Each individual knows what his goal implies to other subsets of society affected by its pursuit (Focus Delphi); its impact over time on himself (Future History); its location in the continuum of time (Scenario); its value shift implications (Value Shift Assessment); and the strategy he would pursue to its attainment (Future History Analysis and Review). Now he must explain its temporal link and value to his institution

to justify their commitment to a policy that pursues his goal.

To prepare his goal for consideration he must answer several questions:

1. If the institution adopted my goal as a top priority item, when is the earliest possible date it could occur knowing the time necessary for each of the activities and events that comprise my proposed sufficient strategies to make it occur?

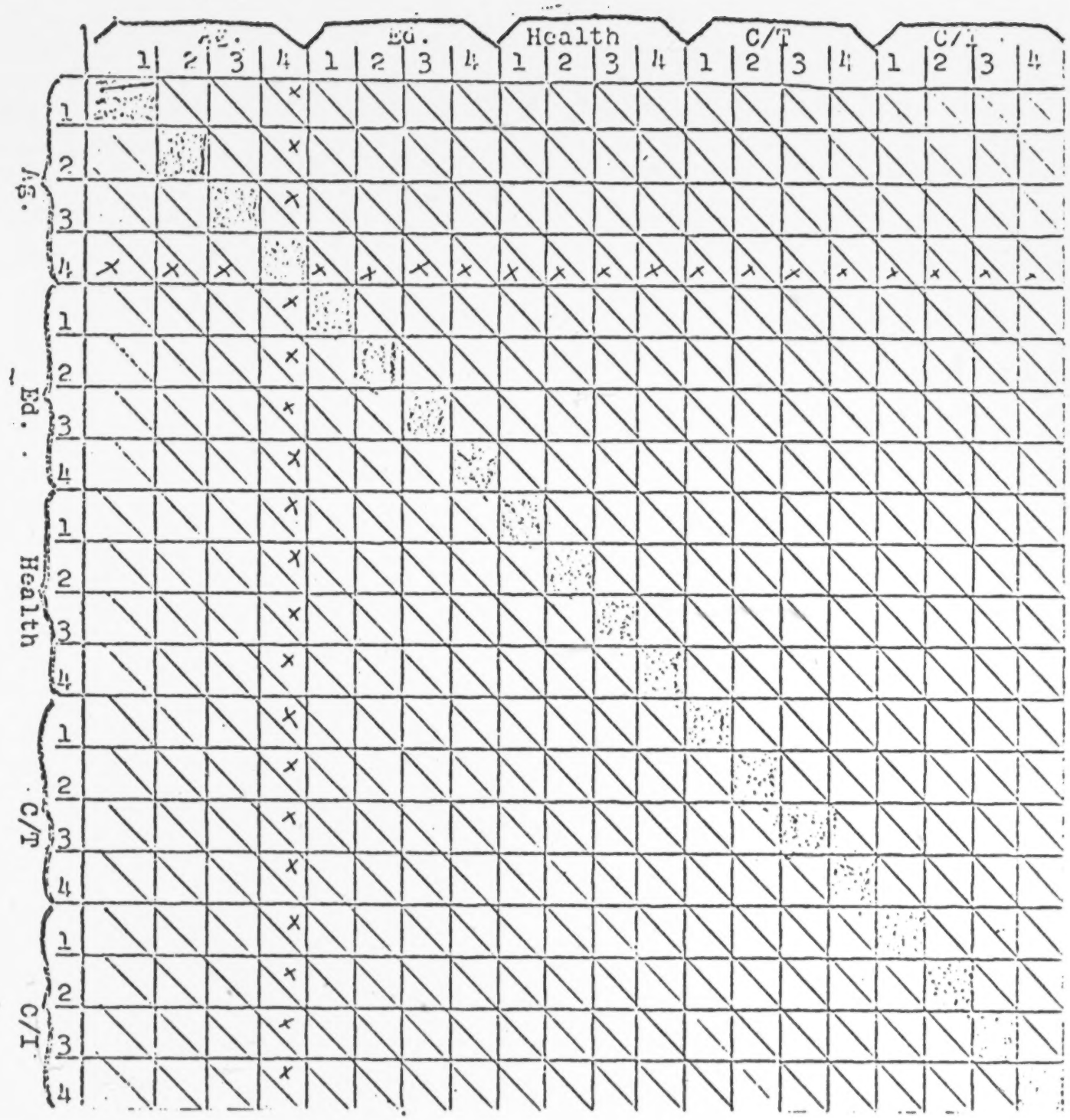
2. I know there are competing goals within the organization, all vying for limited energies. I know them only as cliche statements, but some are probably as worthy as my own. Knowing this, when is it most plausible to assume my goal will be an occurred event?

A matrix is constructed with all the goal statements under examination listed both vertically and horizontally at the side and top of the matrix. The events are listed in chronological order from top to bottom and left to right based on the most plausible estimate of the date of occurrence (question 2) set by the goal advocate. The individual advocates of each goal complete the row

and column appropriate to their goal. The process is as follows: When answering horizontally across the matrix (row), they respond asking themselves for each goal this question: "I assume I am going to be 100% successful in attaining my goal. If so, what will the effect of my success be on the success of each of the other goals as I understand them?" Their response is marked in the bottom half of each square of the cubes in their row in the matrix. The designation of impact is ++, +, 0, -, --. The same goals are approached by each individual vertically (column) on the matrix and responded to in the top half of each box; to respond they ask themselves this question: "I assume their goal is 100% successful. What will <u>its</u> success do to me and my hoped-for success?" They respond again with a ++, +, 0, -, -- scale. (See Chart II, in which hypothetical goal #4 has the appropriate halves of each cell X'ed.)

The individual responses are then displayed on one common matrix, all goal advocates' responses being visible to all. There is now displayed the focusing material necessary for goal assessment through strategy specification. The positive and negative impacts of the several goals as seen by the composite group of goal advocates is arrayed. This array demonstrates to the several individuals the perceptions about each other's planned goals and how they will affect their own pursuits. This exercise compels planners to not consider their goal as given.

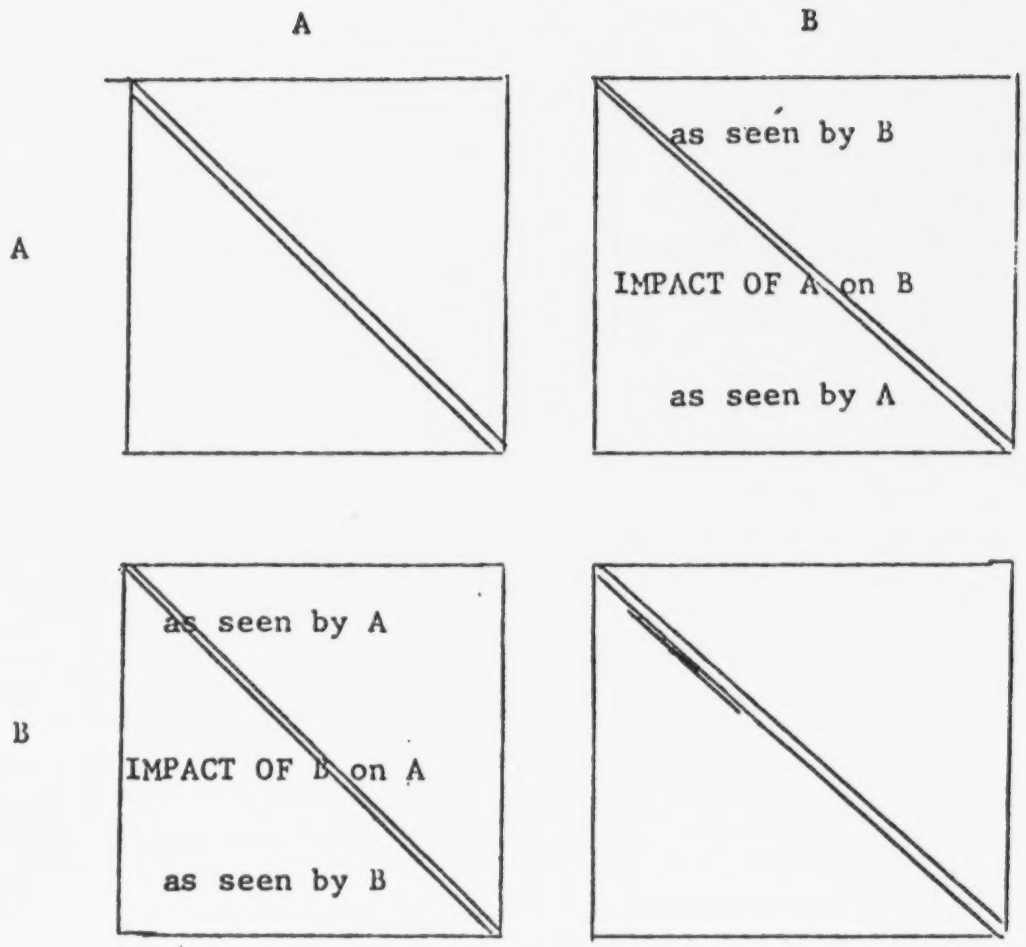
CHART II



In any given cubicle of the matrix a spread of opinion is displayed (See Chart III). The bottom half, along the horizontal, shows the goal advocate's views of the impact of his program's success on the success of the goal listed in the vertical. The top half of the box shows the same information, but from the perceptions of the goal advocate of the vertically listed goal. That is, assume there is a horizontally listed goal, a, and a vertically listed goal, b. Their advocates are indicated by A and B, respectively. In the bottom half of the box, A indicates his view of the effect upon b of the total success of a; in the top half, B answers the effect upon b of the total success of a--both ask the same question, but the answers are from two different perspectives. Each box, of course, has its alternate, where the reverse question (the effect upon a of the total success of b) is asked by each participant. All this acts merely as a stage setter, though the information spread can be analyzed. It is better though that this part be used only to move the planning group forward to a much more important stage of the exercise.

The process is now to force out the sufficient reasons for the spread of opinion in any given box. The groups do this by finding each other and displaying their differing perceptions to each other, i.e., what does this cliche mean; how do you propose to pursue your goal? The process continues until there is displayed in each cubicle

CHART III



CROSS - PURPOSE MATRIX.KEY

++ = strong positive impact

\+ = positive impact

0 = nuetral or no impact

\- = negative impact

-- = strong negative impact

of the matrix only one bit of information. That bit of information is the agreed-to perceptions of both goal aggressors as to the probable impact (- or +) of one goal on the other.

We might now add to this matrix of goals the news events that comprise our future environment over time and ask the participant to respond not only about his goal against the occurrence of all other goals, but his goal if the specified news event should occur. That is,

- If my program is successful, what is its impact on the original forecast of the occurrence of the news event?

- If the news event occurs, what does it do to the hoped-for success of my goal?

At this stage it is appropriate to ask questions of the display, i.e., the output of the matrix. The responses of the several participant advocates gives us an array of perceptions of the impact of the pursuit of any of a set of goals by an institution on all other goals within that institution.

First, in any cubicle of the pre-negotiation matrix (where a spread of opinion may exist) some cubicles may have a common impact sign (+/+); however that should not be taken to mean

common perception of impact. The exposition of the goal itself must be examined:

- It is possible that the perceptions of the several participants were based on the goal as a cliche rather than on the rationale of the advocate.
- It is also possible that the goal is too abstract to be an accurate reflector of changed behaviors foreseen by its advocate.
- It is possible that the idea is new and cannot be understood without its advocate's rationale, the value shifts it pursues.
- It is possible that the goal is agreed to but the strategy to its attainment is very much in debate.

The dynamics of the negotiation can be examined:

- What is the nature of the negotiations? That is, "Who moves?" "Who seeks whom?"
- What is the direction of agreement when they finally arrive at an impact. Is it toward the affected or the affector?

In any institution there are sectors of interest and differing subject concerns. One can examine all the goals in a sector of interest against each other. This helps specify, within any individual sector of interest, a top priority program within that sector; that is, one with high positive impact on all others in that sector. One might also examine programs of one sector against the programs of just one other sector, examining whether or not the sectors interact (have impact on each other) or if any of the programs within them do.

One can examine the negative power cells and the positive power cells. That is, those with a -- or ++, both before and after negotiation. What is the nature of the high impact perceived by both parties? One might also analyze the spread. The spread is in fact quantifiable on an absolute scale. The spread between ++ and -- in any box is an absolute misunderstanding of 4; that is, there is a spread of five digits between those two. The difference between + and 0 is an absolute spread of 1. The absolute spreads could be quantified to examine the size of misunderstanding between certain sectors. That is, does the terminology and value of a sector tend to be misunderstood regularly by another sector.

Next one might examine the general range of impacts of each goal. That is:

- What are the goals that consistently have no perceived impact on any others?
- Which programs are low impact or high impact programs?

One can now examine the stable and unstable programs. For example:

- Which programs tend to be stable, that is, not affected by those external news events mentioned above?
- Which programs tend not to be affected over-all by the occurrence of many news events or the occurrence of all other programs?

Those that are apparently not affected by events we might call stable goals. An unstable program would be one that would be very sensitive to the occurrence of other events as perceived by the participants.

We might examine at what moment in time a goal is unstable and at what moment in time it becomes stable. For example, a new government agency is in an unstable state with virtually any news event impinging upon it up until the moment when it receives its funding. From that moment until the writing of the next funding request, it is for all practical purposes a stable agency. It would

be perceived as such and would be visible in the matrix as such. The value of this kind of analysis might be to allow the executive to calendar those things he feels are fragile at various moments, rather than worrying about everything all the time. Another examination one might make is to focus concern on specific programs within the matrix that have consistent value for all other programs, positive or negative, at the moment when they are planned to occur.

These comments, then, comprise some of the possibilities of the Cross-Purpose Matrix as in interaction device for long-range planning. The Cross-Purpose Matrix represents a confrontation focusing device that compels planners to array their strategies before competing advocates and defend them. The strategies are the reflectors of the planned behaviors over time and the interactions of their several behaviors with the outside world comprise the material base for the set of events that occur and affect the lives of all men in their society. The exercises described above represent a logical set of questions that long-term planners might reasonably confront while preparing to alter the future.

The future environments we as men will actually experience will include the results of the actions of men in the present pursuing what they believe to be worthwhile goals. It is necessary for men to examine their plans for the future in a future environment

(one that is comprised of a set of events they agree are plausible) to examine whether the future environment they will live through should include the events they plan to cause to occur.

Men believe in what they do. It is in the planning stage that they must take the opportunity to suspend their disbelief and examine their ideas in terms of sufficiency to assess their ideas impact in and through time on the lives of us all.

CHAPTER VII

THE STUDY OF THE SUFFICIENT FUTURE: THE LOGIC OF SUSPENDED DISBELIEF

A Discussion

I pay my words more and they do
what I want them to do.

Humpty Dumpty
in Alice in Wonderland
by Lewis Carroll

A discussion should provide a framework that focuses attention on words as they are meant to mean when used. The future is filled with an array of interpretations of words that should help--but often hinder--men when they discuss it. I argue a set of beliefs with words--I mean them to mean specific things.

Starting with the beginning: A man has a role through life that changes through time and is variously manifest at various specific moments in time. Just as man can reflect on memories of his past, his examinations of that future, when causally related, can behave as memories of that future and can thus be reflected upon. They complete a continuum for him from what-has-been to what-can-be. These future histories reflect his plans and strategies to attain or sustain some goal. To construct histories about the unknown future men must suspend their disbelief and trust each step taken into the dark unknown. This process not only allows him to examine the impact of his present pursuits on himself and others at moments in time but it locates the present in the continuum past-to-future (a balance of histories that exist on either side of now).

There are two types of future events: either goals or natural events. A goal is a future event for which an aggressor or advocate can be specified; a natural event is one for which no man or group of men can hold its occurrence as his responsibility. There are almost no natural social events in the age we know. Men make their own world, not some amorphous THEY or THEM. A plausible future environment comprised of future events impacts on each planner's goals. Similarly, the future goals of others enhance or retard the occurrence of the planner's. Within an institution the hidden agenda and strategies of men will affect the goals of the greater institution in that they comprise the controlling input to the institution's ability to operate through time.

Time is filled with static and dynamic occurrences. The activities of men cause events to occur. When activities (dynamic) are pursued through time, moments in time arrive when those activities cause events (static) to occur. All physical goals are events. All social goals are continuing activities. It is the nature of men to be dynamic and active; similarly it is the nature of the entities to be static.

At any moment in time an institution's resources are limited. When priorities must be set to invest more usefully those limited resources, the strategies of the several goal advocates are

as important as is the worth of the goal in specifying the moment of investment. It is the careful explication of the activity-event links that comprise a man's perceptions of his best sufficient strategy through time that determines the value of his goal at some moment in time.

His examinations must be seen by him as merely sufficient. His investment of planning energy is limited and if he slips into a belief in necessary causality in developing his strategy, his options for change through time are eliminated. It is sufficiency, then, that allows a belief in alternative futures and, consequently, options for change that are open to all men through time. We have lived too long in a necessary society.

As with any work there is a desire to assess it against something, determine its value, evaluate its form and content.

An evaluation must focus around the questions directed to individuals for their attention. Are the questions posed here sufficient? And from that base--What questions do men raise as a consequence of responding to the original set detailed here?

An evaluation of the array of methods when seen as a set of questions, must be an evaluation of the sufficiency of the questions in arriving at goals defined clearly enough that priorities can be set for their pursuit through time.

Throughout this work the underlying beliefs expressed are that the future must be seen as an array of sufficient causal relationships. To study and examine a future, an individual must see his examination as merely sufficient. To do this, he must suspend his disbelief to believe his incremental manipulations of events in time. It is at the end of a long and internally consistent examination of several sufficient future developments that priorities can be specified for a given moment in time. When priorities are thus specified and goals pursued, the future becomes necessarily linked to the present. The suspension of disbelief is the only condition that allows men to examine their sufficient plans before they become necessary and imposed on an unexpecting world.

As with all examinations the examiner must have a focus. The doctor must know within what body the activities he observes are acting; similarly, the attorney must know the case his work defines--as the educator must know his students to direct their development.

Individuals examining time must know the body they will be, the world it will see, and the intervening events it will experience, in pursuit of a goal. The parameters of a set of sample events that the planners knows to be other-directed occurrences, and that will place him in a participant or observer status through time must be consistent for all planners involved in an

exercise like this. Thus, their individual efforts can be located against a common framework of events called daily impacting realities.

These parameters are but one sufficient set of reflectors of plausible intervening occurrences that will enhance or retard their several efforts.

When futurists sell to policy-makers techniques that induce consensus, or conformity to an opinion, each individual's ability to suspend his disbelief is threatened--those disagreeing with the consensus find the underpinnings of all their responses about the future weak and hard to sustain.

Consensus is an attempt to induce closure. It is sustained divergence that allows a more thorough examination of plans to exist. Convergence and consensus methods reach closure but eliminate alternative options. The real future will be necessary. It should not be based on an insufficient examination of sufficient alternative futures.

Too early closure prevents suspended disbelief and compels us to operate as if what we do were necessary rather than merely sufficient, inevitable rather than a matter of choice.

BIOGRAPHICAL DATA

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